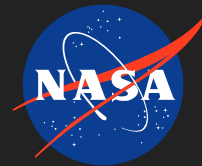


Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I

Completed Technology Project (2018 - 2019)



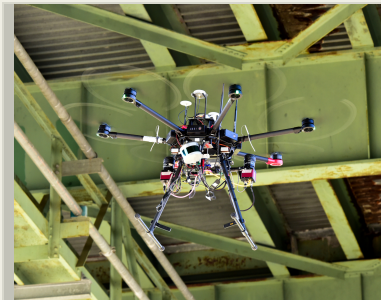
Project Introduction

There is a large unserved and well-defined need in several heavy industrial markets such as steel, petroleum, energy, and mining for aerial inspection, particularly by small Unmanned Aircraft Systems (sUAS) conducting close proximity imaging and contact sensing. We propose to increase the utility of aerial inspection beyond the current state of the art where imagery typically is manually collected from structures at a distance of many meters with technology to enable high quality image coverage at distances near 2 centimeters plus contact sensing along with the creation of comprehensive, fused data products. These close-proximity imaging and contact sensing technologies will enable safer, more cost-effective sUAS inspection of large, complex industrial facilities than is possible by existing human-controlled imaging technology. Near Earth Autonomy is working with key customers in these industries with specific interest in high-value applications. We expect this newly created market to surpass \$1 billion by 2020.

Anticipated Benefits

Direct potential NASA applications include close-proximity and contact sensing inspection of large structures used throughout NASA's operations and facilities. Another is the processing of sensor data into actionable information, a capability that cuts across most or all of NASA's R&D operations. Indirect applications include an unmanned aircraft's ability to gather data about its own state and that of the environment to recognize patterns and make decisions based on the data and patterns.

The technology proposed is directly applicable to inspection of power plants, tanks, towers, bridges, aircraft, ships, and any other large structure that requires periodic assessment and whose stoppage to enable human inspectors to do their work can cause significant loss of revenue or great inconvenience for users (as in the case of bridges).



Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I

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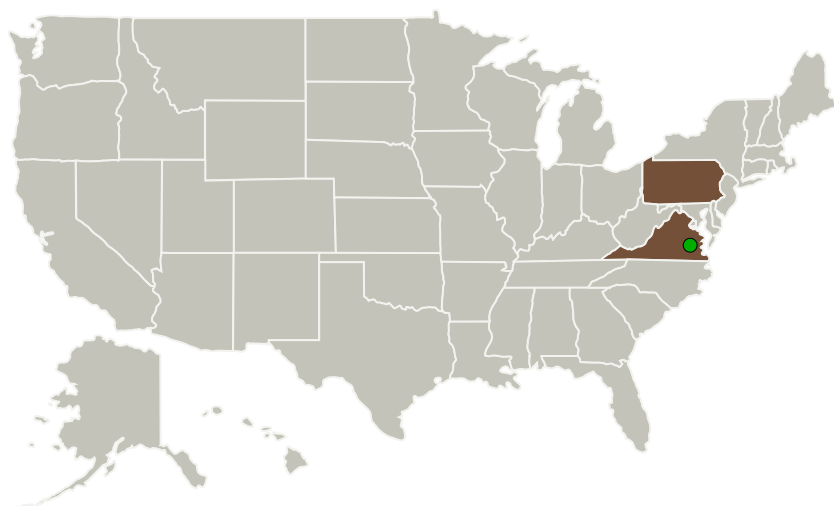
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Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Near Earth Autonomy, Inc.	Lead Organization	Industry	Pittsburgh, Pennsylvania
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Pennsylvania	Virginia
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Project Transitions

▶ **July 2018:** Project Start

✓ **February 2019:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/141038>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Near Earth Autonomy, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Paul Bartlett

Co-Investigator:

Paul W Bartlett

Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I

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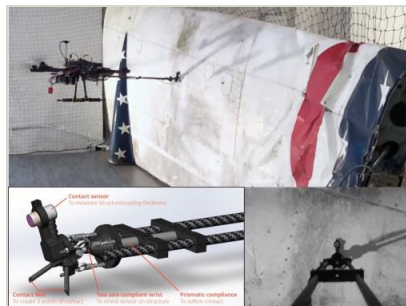


Images



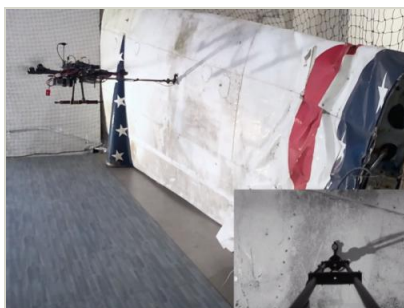
Briefing Chart Image

Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I (<https://techport.nasa.gov/image/129157>)



Final Summary Chart Image

Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I (<https://techport.nasa.gov/image/136440>)

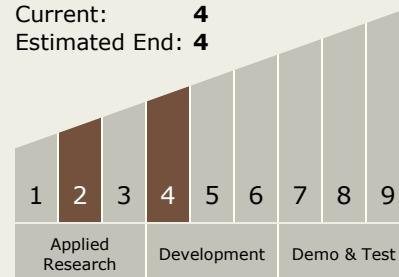


Final Summary Chart Image

Enabling Aerial Close-Proximity and Contact Sensing for Inspection of Industrial Infrastructure, Phase I (<https://techport.nasa.gov/image/134847>)

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



Technology Areas

Primary:

- TX01 Propulsion Systems
 - TX01.3 Aero Propulsion
 - TX01.3.1 Integrated Systems and Ancillary Technologies

Target Destination

Earth